

IN THE CLAIMS

1. (Currently Amended) A method for modifying ground water chemistry in an aquifer comprising the steps of

a) ~~adding an oxygen-containing gas into the aquifer wherein the addition is by diffusion and into at least one aeration well by diffusion, wherein said oxygen-containing gas becomes fully dissolved in said aeration well, and wherein said aeration well operates independently of any other aerations wells; and~~

b) ~~modifying the ground chemistry by gas diffusion~~ advection, diffusion, and dispersion of the fully dissolved oxygen-containing gas into ~~[[the]]~~ said aquifer.

2. (Original) The method of claim 1, wherein the oxygen-containing gas addition is made through aeration wells around a production well.

3. (Currently Amended) The method of claim 1, where said ~~[[the]]~~ aeration wells are equipped with a well screen and diffusers for adding the oxygen-containing gas.

4. (Currently Amended) The method of claim 1, wherein the aeration wells are located at a distance "upstream" from the production well such that modification of ground water chemistry can occur and deleterious effects on a hydraulic capacity of the aquifer are minimized. ~~from the production well which allows desirable reactions occur at a desirable distance "upstream" from the production well and from the aeration wells so that a manipulation of the aquifer does not have deleterious effects on a hydraulic capacity of the aquifer.~~

5. (Original) The method of claim 1, wherein the aeration wells are located at such a distance from the production well that desirable reactions do not decrease the hydraulic capacity at the production well.
6. (Currently Amended) The method of claim 1, wherein the aeration wells are located ~~in a~~ manner to achieve modification of ground water chemistry ~~desirable reactions~~ in such a location and direction from the production well so that the required water quality is achieved.
7. (Original) The method of claim 2, comprising using fine bubble diffusers in the aeration wells to bring about desirable reactions.
8. (Previously Presented) The method of claim 1, wherein there is a reduction of the level of iron, arsenic, and/or manganese in the ground water of the aquifer.
9. (Currently Amended) A method according to claim 1, comprising sequestering or coprecipitating an amount of a target substance ~~such as iron, arsenic, or manganese~~ from the ground water.
10. (Currently Amended) A system for delivering an oxygen-containing gas to ground water comprising independently operating aeration wells around at least one production well wherein the aeration well comprises a means for delivery of the oxygen-containing gas to an aquifer in a fully dissolved ~~finely diffused~~ form.
11. (Original) The system of claim 10, wherein the oxygen-containing gas is injected by fine pore diffusers.
12. (Previously Presented) The system of claim 10 further comprising a controller to monitor gas delivery and to control gas delivery.

13. (Currently Amended) A method for modifying ground water chemistry in an aquifer comprising the steps of a) stripping an area of the aquifer of oxidative gases with an inert gas wherein gas delivery is diffusion; b) adding an oxygen-containing gas and Fe^{+2} into the aquifer; and c) delivering an oxygen containing gas wherein the gas delivery is by diffusion.

14. (Original) A method of claim 13, wherein Fe^{+2} addition is made through delivery wells separate from aeration wells used for gas delivery.

15. (Currently Amended) A method of claim 13, wherein Fe^{+2} addition is made through [[the]] aeration wells.

16. (New) A method according to claim 9, wherein said target substances comprise iron, arsenic, or manganese.